

LAWRENCE LIVERMORE REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, March 7-11, 2011

Ooze into a spewing well



Engineers may one day be able to stop a spewing oil well by using a simple child's plaything: oobleck. It's a weird mixture of cornstarch and water. When it moves slowly, it flows like a liquid. Move it fast, and it freezes into a solid.

Laboratory scientists and a collaborator from Washington University in St. Louis came up with the idea of using oobleck last year.

In May 2010, BP started a "top-kill" procedure, in which it would pump heavy mud down the wellbore in an attempt to stop the oil flow coming out of the Macondo well in the Gulf of Mexico. It would take three months before the oil spill was stopped in July by capping the gushing oil head.

To suppress instability, the mud needed to be a shear-thickening rather than a shear-thinning fluid -- like quicksand. When you fall into quicksand, it is important to move slowly. The faster you move, the more the quicksand resists your movement.

That's where oobleck comes in. To hear more, go to the [Web](#).

Oakland Mayor Jean Quan treks back to hometown



Jean Quan

Livermore native Jean Quan, who is making history as the mayor of Oakland, came to the Lab Wednesday in recognition of Women's History Month. Her talk, based on the theme "Our History is our Strength," was presented to a full auditorium.

Not only is Quan the first woman mayor of Oakland, but she also is the first Asian American elected to that office in 2010. She discussed her views on women in politics, the state of women today, and women's access to math and science careers.

It was fitting for Quan to return to Livermore, the city where she was born and attended school. She remembered being one of only a handful of Asian students at Granada High School. Livermore "was not as diverse then," she said, not like the California cities of today.

"Oakland is one of the most diverse cities in the world," she said. She described her hometown as a gateway for Asian immigrants in the past.

"Today, our children grow up in a world where they know different cultures," she added. About her work as mayor, Quan said, "The personal touch is still important," but suggested that combining the personal with a high tech approach can be successful. When she walks through the city she gets lots of hugs from young girls and is welcomed by Asian Americans. While campaigning last year, she combed Oakland neighborhoods, knocking on doors, getting to know people.

To read more, go to the [Web](#). **Out of sight**



Technician Terri Delima inspects an array.

The Laboratory-developed artificial retina is now on sale in Europe after recently receiving the CE Mark of approval in the European Economic Area.

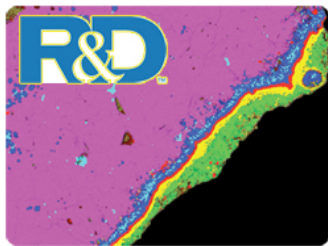
The Argus II, developed by the Laboratory and marketed by Second Sight, is on sale in the European Union (EU), but still awaiting FDA approval in the United States. Clinical trials are under way in the United States.

With the Argus II, blind patients use an external camera to pick up video that is wirelessly transmitted to an electrode array surgically implanted in the eye. While full vision is not restored, the 60+ electrodes allow for some distinction of outlines and other basic shapes.

With the CE Mark obtained, it may only be a matter of time before the Argus II could help millions around the world who have been blinded due to retinal disease.

To read more, go to the [Web](#).

A planet is born



Compositional X-ray image of the rim and margin of an approximately 4.6 billion-year-old calcium aluminum refractory inclusion from the Allende meteorite.

New research from Laboratory scientists about how some of the oldest objects in the solar system took shape from swirling dust may help in learning more about how the planets formed.

Calcium, aluminum-rich inclusions (CAIs) formed far away from our sun and then later fell back into the mid-plane of the solar system.

CAIs, roughly millimeter to centimeter in size, are believed to have formed very early in the evolution of the solar system and had contact with nebular gas, either as solid condensates or as molten droplets. Relative to planetary materials, CAIs are enriched with the lightest oxygen isotope and are believed to record the oxygen composition of solar nebular gas where they grew. CAIs, at 4.57 billion years old, are millions of years older than more modern objects in the solar system, such as planets, which formed about 10 to 50 million years after CAIs.

To read more, see the [Web](#).

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